

Students Name: _____

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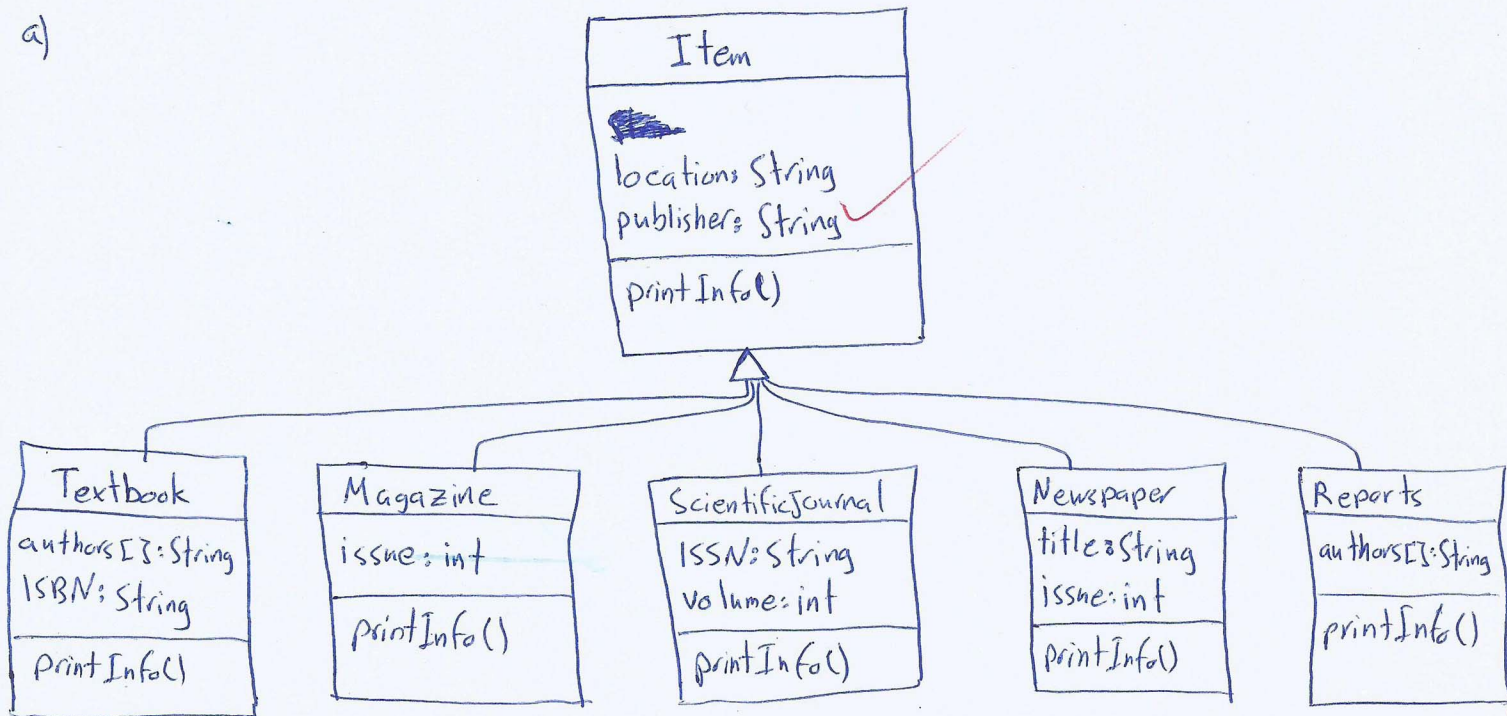
Section: _____

1. Inheritance (6+6)

An item in a library system would have a type and library location. The type could be one of the following a text book (that has a list of authors, publisher, and ISBN), magazine (that has a publisher and issues number), scientific journal (that has an ISSN, publisher, and volume), newspaper (that has a title, publisher, and issue number), and reports (that has authors, and publisher).

- Using UML draw all classes for this system showing their relationships.
- Using 'Java code' show how you would implement/programme the super class and one of its subclasses using inheritance. Your example must include the definition of at least one polymorphic function.

a)



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ITCS341 – Object-Oriented Systems
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Students Name: _____

ID: _____

Section: _____

b) class Item {
 protected String location;
 protected String publisher;

 public Item (String l, String p) {
 location = l;
 publisher = p;
 }

 public void printInfo() {

 System.out.println ("Location:" + location);
 System.out.println ("publisher:" + publisher);
 }

class Magazine extends Item {

 private int issue;

 public Magazine (int i) {

 issue = i;
 }

 public void printInfo() {

 super.printInfo();
 System.out.println ("Issue:" + issue);
 }

 super ()



Students Name: _____

ID: _____

Section: _____

2. Software Development (4+4)

7

- a) What are the main activities of the analysis phase?
- b) State the difference between the **Waterfall** and the **Incremental** development life cycles.

a)

the main activities of the analysis phase is to ~~find~~ ^{gather requirements} solution to the problems and requirements. Some of the methods are: 0.5

- planning
- making glossary
- Conceptual model
- designing use cases.
- sequence diagram.

✓

b) the waterfall development life cycle is sequential and straight forward. After we finish a phase, we can't get back to it because it work like a waterfall. All requirement should be specified in the beginning.

the Incremental development life cycle in the other hand allow us ^{either can be useful?} to get back to previous stages so we can fix things if they were wrong. In the Implementation phase, there is a smaller development life cycle.

✓

Students Name: _____

ID: _____

Section: _____

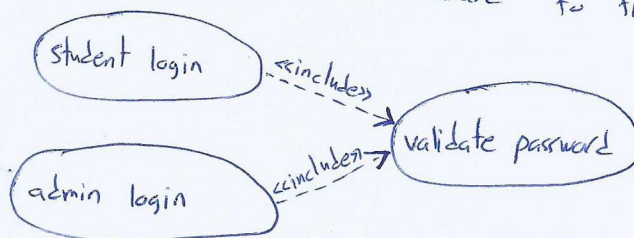
3. Use Case Diagrams (6+4+2)

12

- a) Using diagrams, text, and examples explain what is meant by the three use case relationships?
- b) A flight reservation system allows registered users to search for flights, book a flight, cancel a booking, purchase tickets, and register as a new user.
- Draw all possible use cases for the system?
 - Provide a description for one of them?

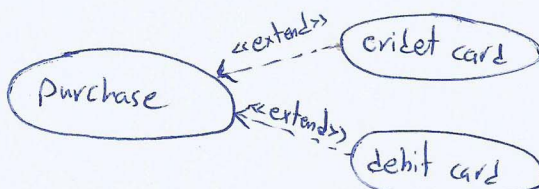
a) - Include: it is a relationship to add (include) new features to the base use case. it is represented by a dashed line with «include» from the base use case to the included.

ex:



- Extend: it is a relationship to extend the behavior of a base use case. it is represented by a dashed line with «extends» from the extended use case to the base.

ex:

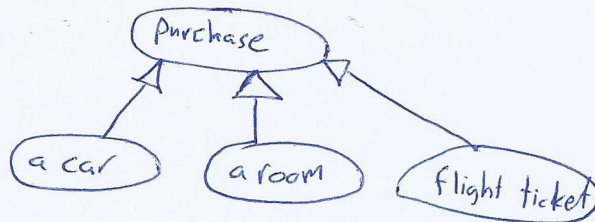


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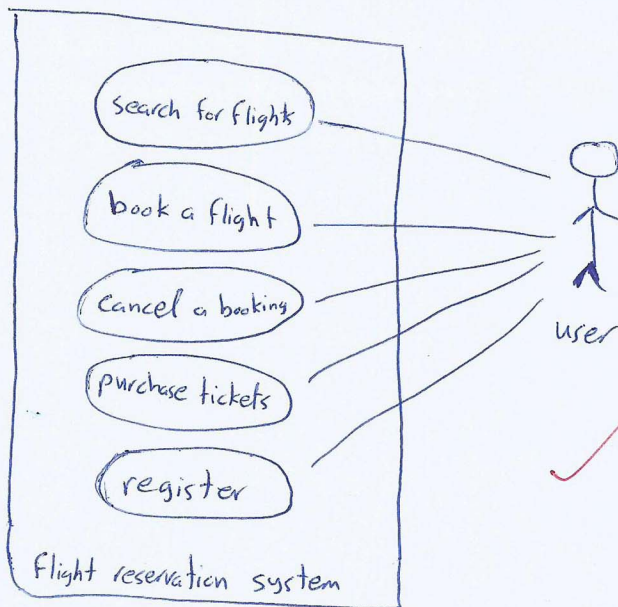
ID: _____

Section: _____

-generalization: it is a relationship to add features to use cases that are similar in more general use cases. it is represented with a hollow arrow to the parent.
ex:



b) i)



description: the system will allow the user to login, then the user will go to "book a flight" tab. the user will see all the available flights with all information about them. Then, the user will select on flight to book.

exception: the user will not be allowed to book for a flight if there is no available seats.

post condition: the system will display the available flights after updating the database.

ii) use case: book a flight.

summary: allow users to book for a flight.

actors: registered user.

pre-condition: the system will display the available flights for booking with its information and available seats

